UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,919	12/03/2001	Jerome Maillot	1252.1056	4265

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EXAMINER
CHEN, PO WEI

ART UNIT	PAPER NUMBER
2676	

DATE MAILED: 01/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/998,919	MAILLOT ET AL.
	Examiner	**Art Unit**	
	Po-Wei (Dennis) Chen	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _October 29, 2003_.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-19,22-25 and 28-38_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-19, 22-25 and 28-38_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ :

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: .

DETAILED ACTION

In response to an Amendment received on October 29, 2003. This action is final.

Claims 1-19, 22-25 and 28-38 are pending in this application. Claims 1, 22, 28, 31, 33-38 are

independent claims.

The present title of the invention is "Dynamically Adjusted Brush For Direct Paint Systems on

Parameterized Multi-Dimensional Surfaces".

The Group Art Unit of the Examiner case is now 2676. Please use the proper Art Unit number to

help us serve you better.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1-7, 9, 11-19, 22-24, 28, 31-35 and 38 rejected under 35 U.S.C. 102(e) as being

anticipated by Daniels et al. (US 6,268,865; refer to as Daniels herein).

3.   Regarding claim 1, Daniels discloses a method for three-dimensional painting

comprising:

Selecting an area of a displayed parametric object living in three dimensional or higher

space; painting a brush directly onto a surface of the area (lines 31-37 of column 2). Also, the

background disclosed by Daniels also suggested the method of painting directly onto the 3-D

surface (lines 63-67 of column 1 and lines 1-2 of column 2).

4.   Regarding claim 2, Daniels discloses a method for three-dimensional painting

comprising:

The painting is performed view independently (lines 19-29 of column 12 and Fig. 9; the

painting brush data is saved independently from the view information).

5.   Regarding claim 3, Daniels discloses a method for three-dimensional painting

comprising:

The painting first aligns the brush to a normal vector of the surface (lines 43-45 of

column 15).

6.   Regarding claim 4, Daniels discloses a method for three-dimensional painting

comprising:

The painting is performed without first painting the brush on a two dimensional texture

space corresponding to the object (lines 11-16 of column 10; the method disclosed by Daniels

does not painting on texture, instead, the painting stroke is being mapped onto the 3-D object

surface).

7.   Regarding claim 5, Daniels discloses a method for three-dimensional painting

comprising:

Converting a selected two dimensional screen coordinate into a three dimensional world

coordinate (lines 30-35 of column 12 and 28-35 of column 13 and Fig. 9).

8.   Regarding claim 6, Daniels discloses a method for three-dimensional painting

comprising:

Identifying an intersection point by intersecting a vector comprising the three

dimensional world coordinate and a viewing direction, and the object (lines 30-35 of column 12

and 28-35 of column 13 and Fig. 9).

9. Regarding claim 7, Daniels discloses a method for three-dimensional painting

comprising:

Computing a tangent plane by computing a normal vector at the intersection point; and

projecting the brush on the three dimensional surface of the selected area using the tangent plane

(lines 41-59 of column 15 and Fig. 15-16).

10. Regarding claim 9, Daniels discloses a method for three-dimensional painting

comprising:

Computing a tangent plane by computing a normal vector at an intersection point where

the brush is applied; and projecting the brush on the surface of the selected area using the tangent

plane (lines 41-59 of column 15 and Fig. 15-16).

11. Regarding claim 11, Daniels discloses a method for three-dimensional painting

comprising:

The brush is two dimensional (element 16 of Fig. 1).

12. Regarding claim 12, Daniels discloses a method for three-dimensional painting

comprising:

The brush is three dimensional (lines 36-37 of column 2).

13. Regarding claim 13, Daniels discloses a method for three-dimensional painting

comprising:

The brush is cylindrical with a defined depth (lines 53-62 of column 2 and lines 16-19 of column 3).

14.   Regarding claim 14, Daniels discloses a method for three-dimensional painting comprising:

An intensity of portions of a brush painting varies based on a normal vector of respective portions of the surface (lines 10-21 of column 17; the brush width corresponds to the intensity of a brush painting).

15.   Regarding claim 15 and 16, Daniels discloses a method for three-dimensional painting comprising:

The painting stops beyond a portion of the surface with a normal vector which varies more than a predetermined angle from an intersection point normal and the predetermined angle is 90 degrees (lines 46-59 of column 15 and Fig. 15). It is noted that the painting corresponds to stroke width. And the width will be limited to a maximum size when normal vector is normal (or 90 degrees) to P, the view point intersection on the surface.

16.   Regarding claim 17, Daniels discloses a method for three-dimensional painting comprising:

The painting stops beyond a portion of the surface when a distance from the brush to the portion of the surface is greater than a predetermined threshold (lines 33-43 of column 8 and Fig. 4). It is noted that the brush width corresponds to painting and it stops when the normal distance is greater than certain threshold depending on the size of brush chose.

17.   Regarding claim 18, Daniels discloses a method for three-dimensional painting comprising:

Before the painting, the brush is rotated in a brush stroke direction (lines 34-41 of column

20).

18.   Regarding claim 19, Daniels discloses a method for three-dimensional painting

comprising:

Before the painting, a brush resolution for the brush is determined and applied (lines 5-9

of column 9).

19.   Regarding claim 22, Daniels discloses a method for three-dimensional painting

comprising:

A method of implementing an effect brush (lines 4-5 of abstract);

Selecting a selected area of a displayed parametric object living in three dimensional or

higher space (lines 3-4 of abstract);

Reverse projecting texture from a surface of the selected area onto a temporary brush (see

lines 19-29 of column 12 and Fig. 9; the saved stroke data corresponds to temporary brush which

is mapped to the surface of the selected view that contains surface map information that

corresponds to texture), processing the temporary brush using a selected process (lines 30-31 of

column 12), and projecting the temporary brush onto the surface of the selected area (lines 28-36

of column 13 and Fig. 9).

20.   Regarding claim 23, Daniels discloses a method for three-dimensional painting

comprising:

The selected process uses a particular filter (lines 21-24 of column 6).

21.   Regarding claim 24, Daniels discloses a method for three-dimensional painting

comprising:

The selected process uses a particular brush (lines 21-24 of column 6; different selected process corresponds to different brush).

22.   Regarding claim 28, as statements presented above, with respect to claims 1 and 9 above are incorporated herein.

23.   Regarding claim 29, Daniels discloses a method for three-dimensional painting comprising:

Determining a normal to the surface at the point (lines 43-45 of column 15 and Fig. 15);

Determining a radius and a depth of the brush in a plane tangent to the surface at the point (lines 46-59 of column 15 and lines 43-67 of column 20 and lines 1-12 of column 21 and Fig. 15). While claim recites radius, by determining the width of the brush, will also determines the radius of the brush. The depth is determined depending on the focus and amount of emphasis given to the point;

Bringing the brush and the surface into coincidence along the normal (lines 28-36 of column 13 and lines 46-59 of column 15 and Fig. 9 and 15). It is noted the brush width data is being determined and mapped on the surface normal point;

Determining portions of the object intersected by the brush using the depth and the radius (lines 46-59 of column 15 and lines 43-67 of column 20 and lines 1-12 of column 21 and Fig. 15). The width of the brush corresponds to the portion of the object intersected by the brush and depending on the focus and amount of emphasis, different width is computed;

Applying paint to corresponding portions of object texture in texture space (lines 19-29 of column 12 and lines 28-36 of column 13). The brush data is being mapped on to the object surface which contains surface map information that corresponds to texture;

While Daniels does not disclose applying the texture to the object in the invention, the

method is disclosed in the background information (lines 55-62 of column 1).

24.   Regarding claim 31, Daniels discloses a method for three-dimensional painting

comprising:

Defining a series of points on the parameterized object representing a stroke (lines 29-35

of column 6 and Fig. 2);

Positioning and orienting a brush stamp for each point in the series of points in a view

independent manner (lines 29-35 of column 6 and lines 19-29 of column 12 and Fig. 9; the brush

point data is saved independently from the view information);

Painting the stroke into an object texture as a collection of texture modifications using the

brush stamp for each point (lines 28-36 of column 13 and Fig. 9; the surface map information

corresponds to texture information and is being modified by the brush stroke data).

25.   Regarding claim 32, Daniels discloses a method for three-dimensional painting

comprising:

A method as recited in claim 1, further comprising compiling images produced by the

painting into a movie (lines 1-2 of abstract).

26.   Regarding claim 33, as statements presented above, with respect to claims 1 and 32 are

incorporated herein.

27.   Regarding claim 34, as statements presented above, with respect to claim 1 are

incorporated herein. Also see Fig. 29.

28.   Regarding claim 35, as statements presented above, with respect to claim 1 are

incorporated herein.

29.   Regarding claim 38, as statements presented above, with respect to claim 1 are

incorporated herein. It is further noted that the brush stroke being applied to the surface is

defined in accordance with the tangent plane (lines 41-59 of column 15 and Fig. 15-16). Thus, it

functions as using a tangent space brush.

Claim Rejections - 35 USC § 103

30.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

31.   Claims 8, 10 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Daniels et al. (US 6,268,865; refer to as Daniels herein), as applied to claims 1 and 28 above, and

further in view of Morioka et al. (US 6,239,809; refer to as Morioka herein).

32.   Regarding claims 8, 10 and 30, Daniels discloses a method for three-dimensional painting

comprising normal vector (element 253 of Fig. 15). It is noted that Daniels does not disclose

interpolated normal vector. However, this is known in the art taught by Morioka. Morioka

teaches a image processing comprising a interpolated normal vector (lines 28-31 of column 12).

It would have been obvious to one of ordinary skill in the art at time of invention to utilize the

teaching of Morioka to provide a more efficient image processing (lines 17-21 of column 2,

Morioka). Also, both Daniels and Morioka are directed to image processing in three-

dimensional space.

33.   Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daniels et al. (US

6,268,865; refer to as Daniels herein), as applied to claim 22 above, and further in view of

Bossut (US 6,239,807).

34.   Regarding claim 25, it is noted that Daniels does not disclose the particular brush is

selected based on a determination of an appropriate brush resolution. However, this is known in

the art taught by Bossut. Bossut teaches a method for multi-resolution texture mapping that

"offers the user the capability of touching up coarse details at one resolution, and fine details at a

magnified resolution" (lines 49-60 of column 6). It would have been obvious to one of ordinary

skill in the art at time of invention to utilize the teaching of Bossut to provide the advantage of

allowing user to choose the appropriate resolution for painting the image.

35.   Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daniels et al. (US

6,268,865; refer to as Daniels herein) and further in view of Morioka et al. (US 6,239,809; refer

to as Morioka herein).

36.   Regarding claim 36, as statements presented above, with respect to claims 1-8, 14, 15 and

17 are incorporated herein.

37.   Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiss (US

5,592,597) and further in view of Daniels et al. (US 6,268,865; refer to as Daniels herein).

38.   Regarding claim 37, Kiss discloses a real-time image generation system with 3-D

graphics comprising:

        Selecting an area of a displayed parametric object in a three dimensional space; painting

the brush directly onto a surface of the area in the three dimensional space (lines 10-15 of

column 8 and lines 17-25 of column 9 and Fig. 1-2; it is noted that any view of the object can be

selected for painting process).

Kiss does not disclose determining a brush based on an appropriate brush resolution.

Daniels discloses a method for three-dimensional painting utilizing the method (lines 5-15 of

column 9; it is noted that the brush strokes being used can be at different resolutions by using the

brush profile to define the appropriate resolution for display). It would have been obvious to one

of ordinary skill in the art to utilize the teaching of Daniels to provide the advantages of speed

and efficiency when painting brush strokes onto image surfaces such as one disclosed by Kiss

(lines 13-15 of column 9 of Daniels).

Response to Arguments

39.   Applicant's arguments filed October 29, 2003 have been fully considered but they are not

persuasive.

The Applicant argues reference Daniels does not disclose painting a brush directly onto a

surface of the area displaying parametric objects in 3D. However, the limitations presented in

claim 1 is met by the teaching of Daniels as statements presented above with respect to claim 1

above are incorporated herein. While claim recites selecting an area of a displayed parametric

object living in three dimensional or higher space, by selecting a view of a 3-D model object (a

parametric object living in three dimensional), the limitation is met. Furthermore, the brush is

being painted directly onto the view selected (a surface of the area). Since the claim only recites

selecting the area of the object living in three dimensional space and does not disclose the

painting is done on the surface of the area in three dimensional, the limitation is met by Daniels.

The Applicant argues reference Daniels does not show painting in a view independent manner. However, the limitations presented in claim 2 is met by the teaching of Daniels as statements presented above with respect to claim 2 are incorporated herein. While claim recites painting is performed view independently, the terms are broad enough to include the method disclosed by Daniels where the painting brush data is being saved independently from the view information.

The Applicant argues reference Daniels discloses avoiding painting on texture for a different purpose disclosed by the Applicant. However, the limitations presented in claim 4 is met by the teaching of Daniels as statements presented above with respect to claim 4 are incorporated herein. The limitation does not disclose any other detail and is broad enough to include the method disclosed by Daniels where the painting stroke is being mapped onto the 3-D object surface without painting on the texture.

Regarding claims 8, 10 and 30, the Applicant argues it would not have been obvious to combine references Daniels with Morioka. However, by utilize the teaching of interpolating normal vector, it will provide a better result of calculating pixel values for image processing in three-dimensional space such as one disclosed by Daniels. Furthermore, a more efficient image processing will be achieved (lines 17-21 of column 2 of Morioka).

Conclusion

40.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Geshwind (US 6,590,573).

41.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this

final action.

Inquiry

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Po-Wei (Dennis) Chen whose telephone number is (703) 305-

8365. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matthew C Bella can be reached on (703) 308-6829. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305-3900.

Po-Wei (Dennis) Chen
Examiner
Art Unit 2676

Po-Wei (Dennis) Chen
December 31, 2003

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600